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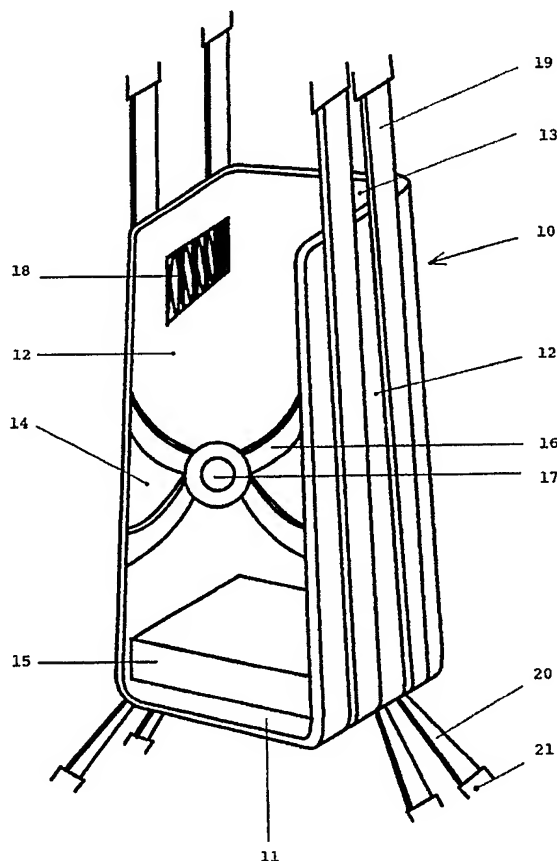
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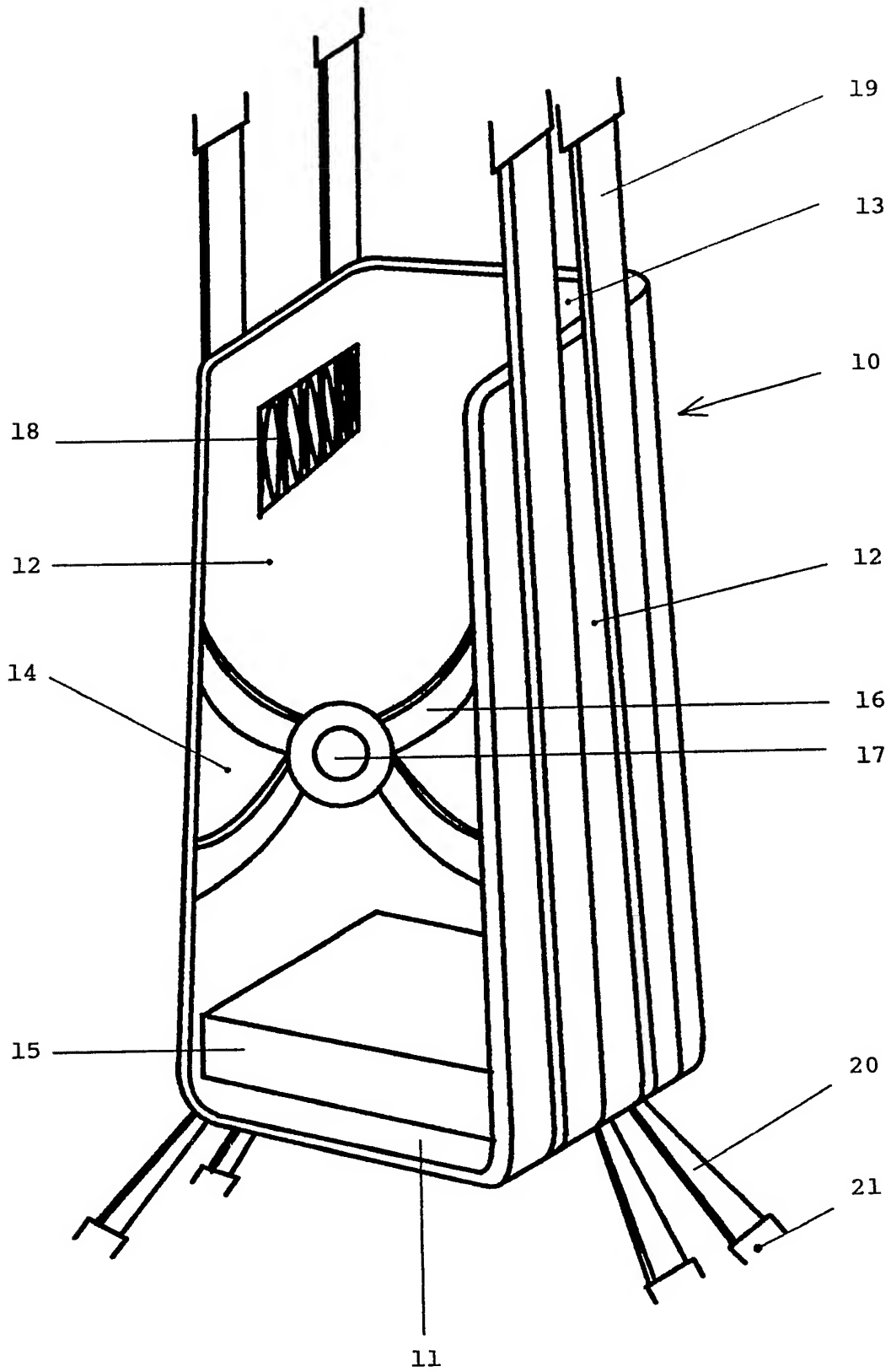
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## (54) Textile safety seat

(57) Safety seat, for vehicles, having a seat base, back and side parts and a safety belt arrangement to secure the persons to be transported, the safety seat being constructed as a closed textile cover (10) with an entry (14), the cover having a seat base (11) and enclosing the occupant's body in the back and sides to above head height, and the cover (10) being fixable above and below, by means of fastening belts (19, 20) fitted thereto, between vehicle-fixed fastening points provided on the floor and in the roof area of the vehicle, the safety seat offering, on the one hand, effective securing of occupants against, in particular, transverse accelerations and, on the other hand, being capable of being dismantled easily for transportation.



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## Textile Safety Seat

The invention relates to a safety seat for vehicles, in particular in aircraft and in marine  
5 vehicles, having a seat, back and side parts and having a safety belt to secure the persons to be transported, with the back and side parts which support the occupant's body in the back and sides being made of a textile material.

10 In vehicles used in the field of aviation and also in marine vehicles, in particular transport aircraft and helicopters, there is the problem that in addition to the transportation of change-over crews, as large a transport and loading area as possible should  
15 also be available. For this reason, the seats to be used for the transportation of people should be capable of being dismantled as easily as possible and should be capable of being stored in a space-saving manner. On the other hand, the seats should present the highest  
20 level of safety against physical stresses possibly occurring during the transportation, since the seats, in particular with transport aircraft and helicopters, are usually arranged at right angles to the flight direction, so that in the event of a crash the force of  
25 impact acts on the sides of the bodies of the occupants being transported.

A safety seat with the aforementioned features is described in US-PS 3 314 720. The safety seat known in this respect consists of a seat frame  
30 supported in a hinged manner on a vehicle part, the seat frame having a seat, with a cover consisting of a textile material and having a back part and two side parts being fastened to the seat frame by means of belts. The securing of an occupant seated on the seat  
35 takes place by means of a three-point safety belt with a lap belt supported on the seat frame and a diagonal shoulder belt fastened to the fastening belt for the

textile cover.

Another safety seat is known from US-PS 44 74 347 which describes a fixed seat connected to supporting pipes anchored to the floor of the vehicle and constructed as shock absorbers; the back support is provided by a fabric surface which is fixed between two belts extended from the supporting pipes of the seat to the roof area of the vehicle. To secure the occupants there is a braces belt arrangement with a lap belt fastened to the supporting pipes holding the seat and two shoulder belts fastened to the seat tightening belts.

A further safety seat is disclosed in US-PS 2 700 412, where a textile seat is fixed between a seat frame supported in a hinged manner on a vehicle part; the back support is provided by a textile surface fixed in the same way between pipe parts. The securing of the occupants takes place by way of simple lap belts supported on the seat frame.

There is connected with the previously known seats in each case the disadvantage that on the one hand the securing of the occupants against transverse acceleration by way of the safety belts used is completely insufficient, since, according to the acceleration forces acting thereon, the occupant's body is either pressed hard into the belt and is thereby strained at points or, on the other hand, according to the construction of the safety belt, it is even rotated out of the belt completely. On the other hand, despite the fixed components, installed in a partially hinged manner, for the construction of the seat and for the, in particular force-absorbing, fastening of the safety belts, the loading area cannot be emptied completely; in addition, the equipment of vehicles with the necessary components is comparatively costly and the components, with the manufacture of the vehicle, must

be included in the considerations for the application of the vehicles.

The object of the invention, therefore, is to make available a safety seat with the features of the generic type, which, on the one hand, offers an effective securing of the occupants against, in particular, transverse accelerations, and, on the other hand, can be dismantled easily and transported or carried.

The solution to this object is evident from the main claim; advantageous developments and further formations of the invention are indicated in the subclaims.

The invention provides in its fundamental idea that the safety seat is constructed as a closed, textile cover with an entry, the cover having a seat and enclosing the occupant's body at the back and sides to above head height, and that the cover can be fixed above and below, by means of fastening belts fitted to it, between vehicle-fixed fastening points provided on the floor and in the roof area of the vehicle.

Numerous advantages are connected with the invention. In this way the textile cover enclosing the occupant's body to above head height gives a complete, flexible protection against occurring transverse accelerations, with in particular the head, wearing a helmet and weighted thereby, being protected; in the process the textile cover already acts in an energy-absorbing manner due to its flexibility. Furthermore, the seat consisting of the textile cover can be easily dismantled by simple unlatching of its fastening belts from the vehicle-fixed fastening points and can be stowed away in a space-saving manner; if need be, it can even be carried by the occupant and if necessary even suspended. From this there results the particular advantage that with dismantled seats the entire loading

area of the relevant vehicle without components is available for a loading. Since the textile cover, furthermore, completely encloses the occupant's body with the exception of the entry, the safety seat formed  
5 by the textile cover can be used for all stress directions, that is to say sideways, to the right, left and forwards, so that this safety seat can be installed in any configuration without consideration of other factors, provided that suitable fastening points are  
10 supplied. Since, furthermore, all parts of the safety seat in accordance with the invention consist of textile material, danger of injury in the event of a crash is minimized; moreover, the safety seat is advantageously very light-weight and favourable in  
15 terms of cost in manufacture.

According to an exemplary embodiment of the invention, the textile cover has a conical cut issuing from the seat towards the head region of the occupant, so that the side parts and the back part enclose the  
20 occupant's shoulders and head in an abutting manner; due to this cut the textile cover tightens slightly when the occupant sits inside, with the result that the cover is brought with a slight prestressing into contact with the shoulders and helmet-protected head,  
25 with which there is connected a further improvement of the securing against transverse accelerations.

In accordance with an exemplary embodiment, a form-giving seat pad is worked into the seat region of the cover, the seat pad at the same time also being  
30 capable of specifying the form for a folding-together of the safety seat.

It can be provided that a coating of a sound-reducing material is applied to the inner sides of the side parts of the textile cover at head height, so that  
35 the noise effect, in particular with the use of the safety seat in helicopters, can thereby be reduced.

Furthermore, the cover is equipped with a safety belt closing the entry, with several safety belts which span the occupant's body in the front region being capable of being brought together in a central belt lock.

To improve the energy absorption in the event of a crash, it can be provided that the fastening belts bracing the textile safety seat are provided either completely or at least partially with energy-absorbing shock absorbers, in particular with a shock absorber having a textile construction.

It can be provided that the fastening belts leading to the vehicle-fixed fastening points placed above the cover have a course enclosing the side parts and the seat in a circumferential manner, with the belts which lead away to the top being capable of being brought together either in separate fastening points or, on the other hand, in a common vehicle-fixed fastening point; in such a development the textile cover rests as a whole in the loop-like upper fastening belts; in this respect the fastening belts are preferably connected, in particular sewn up, on their entire contact length with the textile cover of the safety seat.

It is advantageous if, in accordance with an exemplary embodiment of the invention, the fastening belts leading to the vehicle-fixed fastening points lying underneath the cover are provided with a self-tightening device, since the textile cover upon loading with an occupant gives downwards and in this way an automatic adjustment of the lower fastening belts is guaranteed. In this respect, in accordance with an exemplary embodiment, the lower fastening belts are connected directly to the upper fastening belts which enclose the textile cover in a loop-like manner.

The invention can be realized particularly

advantageously if the fastening points provided in the roof area of the vehicle are fitted directly to the body of the vehicle, preferably an aircraft. However, in accordance with an exemplary embodiment, the invention also extends to the application of a separate frame to the floor of the vehicle, which frame has a fastening point lying in the roof area of the vehicle, so that the safety seat constructed as a textile cover can be suspended with its upper fastening belts into the fastening point arranged on the frame, while the lower fastening belts are anchored to the floor of the vehicle.

In the drawing an exemplary embodiment of the invention is reproduced and will be described, by way of example, in the following. The single Figure shows a schematic representation of a safety seat consisting of a textile cover.

It is to be understood that insofar as alternative constructions described above are not again described hereinafter, such constructions can nevertheless be incorporated into the embodiment now to be described.

The safety seat is formed by a textile cover 10, which consists of a seat base 11, side parts 12 and a back part 13; the textile cover 10, which is otherwise closed, in this respect has an entry 14 for the occupant to sit inside the textile cover. Side parts 12 and back part 13 are in this respect pulled up so high that the side parts 12 and the back part 13 reach beyond the head region of the occupant who is strapped in.

In the seat base area 11 a seat pad 15 is worked into the textile cover 10, the pad acting in this region in a form-giving manner for the textile cover 10. Issuing from the seat pad 15, the side parts 12 and the back part 13 have a slightly conical course,

so that the aforementioned parts converge towards the head region of the occupant to be transported and accordingly enclose the shoulders and head. The entry region 14 in this respect is closed by, in this case, 5 four single safety belts 16, which are brought together in a central belt lock 17 of the usual type of construction. The inner sides of the side parts 12 are provided at head height with a coating 18 of a sound-reducing material.

10               The textile cover 10 is to be anchored by way of upper fastening belts 19 and lower fastening belts 20 to vehicle-fixed fastening points which are not represented further. The upper belts 19 extending to the upper fastening points have a u-shaped loop-like 15 course and enclose the side parts and the seat in a circumferential manner. The belts 19 are preferably firmly connected, preferably sewn, to the side parts 12 and the seat base 11 of the textile cover 10 over the entire contact length.

20               In the exemplary embodiment represented, the lower belts 20 extending to the lower fastening points are sewn to the seat base 11 and are installed for fastening in a spread arrangement, so that the spread lower belts accordingly counteract transverse 25 accelerations in particular. At the lower belts 20 a self-tightening device 21 is indicated, which device ensures that upon a straining of the textile cover 10, brought about by an occupant to be transported sitting down, and upon the lowering of the textile cover, 30 connected therewith, the lower belts 20 retighten themselves so that there is no belt slack in this region.

              As is not represented in more detail, all the belts 19, 20 or a part thereof can be provided with 35 energy-absorbing shock absorbers, preferably those which have a textile construction.

Claims

1. Safety seat, for vehicles, having a seat base, back and side parts and having a safety belt arrangement to secure the persons to be transported, with the back and side parts which support the occupant's body in the back and sides being made of a textile material, the safety seat being constructed as a closed textile cover with an entry, the cover having a seat base and enclosing the occupant's body in the back and sides to above head height, and the cover being fixable above and below, by means of fastening belts fitted thereto, between vehicle-fixed fastening points provided on the floor and in the roof area of the vehicle.

2. Safety seat according to claim 1, wherein the cover, issuing from the seat base to the head region of the occupant, has a conical cut, so that the side parts and the back part enclose the occupant's head and shoulders in an abutting manner.

3. Safety seat according to claim 1 or 2, wherein the cover has a form-giving seat pad in the seat base.

4. Safety seat according to claim 1, 2 or 3, wherein the inner sides of the side parts of the cover are provided at head height with a coating of a sound-reducing material.

5. Safety seat according to any one of claims 1 to 4, wherein the cover is provided with a safety belt arrangement closing its entry.

6. Safety seat according to any one of claims 1 to 5, wherein the fastening belts are provided with energy-absorbing shock absorbers.

7. Safety seat according to any one of claims 1 to 6, wherein the fastening belts leading to the vehicle-fixed fastening points placed above the

cover have a course which encloses the side parts and the seat base of the cover in a circumferential manner.

8. Safety seat according to claim 7, wherein the fastening belts leading to the vehicle-fixed  
5 fastening points placed above the cover are firmly connected to the cover along their entire contact length with the cover.

9. Safety seat according to any one of claims 1 to 8, wherein the fastening belts leading to  
10 the vehicle-fixed fastening points lying underneath the cover are provided with a self-tightening device.

10. Safety seat according to claim 9, wherein the fastening belts leading to the vehicle-fixed fastening points lying underneath the cover are  
15 installed for fastening in a spread arrangement.

11. Safety seat according to claim 8, 9 or 10, wherein the fastening belts leading to the vehicle-fixed fastening points lying underneath the cover are directly connected to the fastening belts leading to  
20 the vehicle-fixed fastening points placed above the cover.

12. Safety seat according to any one of claims 1 to 11, wherein the textile cover with the fastening belts leading to the vehicle-fixed fastening  
25 points placed above the cover can be suspended into a frame, to be mounted on the floor of the vehicle, with fastening belts lying in the roof area of the vehicle.

13. A safety seat, for vehicles, substantially as hereinbefore described with reference  
30 to the accompanying drawing.

- 10 -

**Relevant Technical Fields**

- (i) UK Cl (Ed.M) A4L. LAL, CBEP, LBEJ, LBSE, LBSD  
 (ii) Int Cl (Ed.5) A47C

**Databases (see below)**

- (i) UK Patent Office collections of GB, EP, WO and US patent specifications.  
 (ii) ONLINE DATABASE: WPI

Search Examiner  
 J GRAHAM

Date of completion of Search  
 10 JUNE 1994

Documents considered relevant  
 following a search in respect of  
 Claims :-  
 1-13

**Categories of documents**

- X:** Document indicating lack of novelty or of inventive step. **P:** Document published on or after the declared priority date but before the filing date of the present application.  
**Y:** Document indicating lack of inventive step if combined with one or more other documents of the same category. **E:** Patent document published on or after, but with priority date earlier than, the filing date of the present application.  
**A:** Document indicating technological background and/or state of the art. **&:** Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages		Relevant to claim(s)
Y	US 3868143	(SEC OF NAVY) see eg column 2 lines 46-49 and column 3 lines 10-15	6,10
X,Y	US 2829702	(SEC OF NAVY) see eg column 3 lines 43-50	1,2,5-8, 10-12

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